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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/525,847

02/25/2005

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EXAMINER

WU, IVES J

ART UNIT

PAPER NUMBER

1724

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/29/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/525,847	TSUKAMOTO ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Ives Wu	1724	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 November 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

- (1). Applicants' Amendments and Remarks filed on November 15, 2006 have been received. Claims 1 and 2 are amended.

The rejection for claims 1 and 2 are revised in response to the Amendments filed on November 15, 2006 and presented with rest of claims in the following.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- (2). **Claims 2, 3, 13-17 and 19** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claim 2, it recites: "in the presence of carbon dioxide amounting to 10% or less of the total number of moles of said carbon dioxide and said radical polymerizable monomer".

However, it also recites: "said carbon dioxide amounts to at most equimolar to said radical polymerizable monomer" in the next paragraph of the instant claim 2. Since two limitations are inconsistent with each other, one of ordinary skills in the art would not know which one would present the inventive subject matters.

**Claims 3, 13-17 and 19** are rejected because they depend on claim 2.

- (3). **Claim 6** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 6** recites the limitation "continuous polymerization" in claim 5. There is insufficient antecedent basis for this limitation in the claim.

#### ***Claim Rejections - 35 USC § 102/103***

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The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

(4). **Claims 1 and 4-11, 18** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Stallings (US003780007).

(5). Stallings (US003780007) discloses an improved process for preparing a fluoropolymer by polymerizing vinylidene fluoride monomers in aqueous suspension. In reaction field, vinylidene fluoride monomer is compressed and densified in supercritical state to a degree which continuously assures its uniform dispersion in the reaction medium. Optimum yield of high molecular weight and high crystalline polymer product are obtained. This process is easily adapted to the continuous production of poly(vinylidene fluoride) (Abstract, Col. 3, line 12-16). Illustrated in the Examples such as example 1, the pressure is at 2000 psig which is equivalent to 14 Mpa and reaction temperature at 55 °C. The weight average molecular weight measured by the intrinsic viscosity shown in the Table 1 is above 150,000 (Col. 6, line 42-44, Col. 8).

Specific organic peroxy compounds for initiator suitably employed include diisopropyl peroxydicarbonate, tertiary butyl peroxy-pivalate etc (Col. 3, line 72 – Col. 4, line 2).

Suitable chain transfer agents employed include lower aliphatic e.g., methanol, ethanol etc, (Col. 4, line 19-39).

(6). As to the Mw/Mn of fluoropolymer of higher than 1 but not higher than 3 in the **independent claim 1**, in view of substantially identical claimed method of making the fluoropolymer disclosed by applicant and Stallings, it is the examiner's position to believe that the product of fluoropolymer made by the method of Stallings would inherently possess the molecular weight distribution from 1 to not higher than 3. Since USPTO does not have proper means to conduct the experiments, the burden is now shifted to the applicant to prove otherwise. *In re Fitzgerald*, 205 USPQ 594 (CCPA 1980).

As to the defined reaction field to give the fluoropolymer avoiding the use of carbon dioxide in **independent claim 1**, Stallings (US003780007) does not disclose the use of carbon dioxide.

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As to the limitation of **dependent claim 4**, Stallings disclose the density of monomer in the water being remained around 0.69 g/cc during the polymerization, the  $\rho_m/\rho_c = 1.65$  ( $\rho_c = 0.47$  g/cc, Col. 3, line 8-11) in Example 1 (Col. 7).

As to limitation of **claim 6**, in the absence of showing criticality, the optimized capacity at steady state in a continuous polymerization reaction vessel to be at least 8 g/liter in known process renders prima facie obviousness within one of ordinary skills in the art. *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980).

As to the fluoropolymer producing method comprising continuously supplying the radical polymerizable monomer to the defined reaction-field and continuously discharging fluoropolymer product from the reaction-field in **claim 18**, Stallings discloses the process easily adapted to continuous production of polyvinylidene fluoride (Col. 1, line 24-26).

(7). **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over Stallings (US003780007) in view of Saito et al (US006716942B1).

As to the nonethylenic fluorocarbon in the presence of polymerization in dependent claim 12, Stallings **does not teach** the use of a nonethylenic fluorocarbon.

However, Saito et al **teach** the fluorocarbon to be present in the reaction field. Examples of the fluorocarbon are hydrofluorocarbons such as pentafluoroethane, tetrafluoroethane, difluoromethane and the like (Col. 6, line 33-38).

The advantages of employing the nonethylenic fluorocarbon in the reaction field is to dilute the monomer, to help eliminate a reaction heat and to adjust a solubility of a produced polymer into a reaction system (Col. 6, line 38-41).

Therefore, it would have been obvious at time the invention was made to include the nonethylenic fluorocarbon of Saito et al in the reaction field of Stallings in order to obtain the aforementioned advantages.

(8). **Claims 2, 3, 13-17 and 19** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Stallings (US003780007).

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As to the carbon dioxide amounting to 10 % or less of the total number of moles of said carbon dioxide and said radical polymerizable monomer in **independent claim 2**, in any event, it can be **ZERO**.

As to the rest limitation of **independent claim 2** and **claim 3**, the disclosure of Stallings is incorporated herein by reference, the most subject matters of supercritical-expression state, polymerizable monomer comprising a fluorine-containing ethylenical monomer, Mw not lower than 150,000 ratio of Mw/Mn to be between 1 and 3, reaction pressure not higher than 40 Mpa, reaction temperature higher by 100 °C than supercriticality-expression temperature of said defined reaction-field as currently claimed, have been recited in applicant's claim 1, and have been discussed therein, also recited in paragraph (5).

As to limitation of **claims 13, 15, 16-17**, the disclosure of Stalling is incorporated herein by reference, the most subject matters of chain transfer agent, radical polymerization initiator being organic peroxide comprising peroxydicarbonate, a fluoride-based diacyl peroxide and/or a fluorine-free diacyl peroxide as currently claimed, have been recited in paragraph (5).

As to limitation of **claims 14 and 19**, the disclosure of Stalling is incorporated herein by reference, the most subject matters of reaction capacity to be at least 8 g/liter in continuous mode as currently claimed, have been recited in applicant's claim 6 and 18 and have been discussed therein.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1 and 2 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ives Wu whose telephone number is 571-272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu

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Date: January 22, 2007

DUANE SMITH  
PRIMARY EXAMINER

*D - A*  
*1-23-07*